CLAIMS

The embodiments of the invention in which an exclusive property or right is claimed are defined as follows. Having thus described the invention what is claimed is:

1. A vapor sensor apparatus, comprising:

a substrate containing a sensing element, wherein said substrate is located proximate to a sleeve portion which covers and protects said sensing element;

a vapor filter affixed to an end of said sleeve portion, wherein said end of said sleeve portion is located opposite said sensing element; and

a housing for retaining said substrate and a cover which snaps onto said housing, wherein said housing comprises walls from which a hole is formed through which vapors may pass, and wherein housing and said cover protect said vapor sensor apparatus from gravitationally settled materials thereof.

2. The apparatus of claim 1 wherein said vapor filter comprises a permeable membrane.

3. The apparatus of claim 1 comprising a plurality of contoured surfaces which form least one recessed area from plurality of contoured surfaces, such that said at least one recessed area allows access to vapors to said hole.

4. The apparatus of claim 1, wherein said hole is located centrally over above sensing element.

5. The apparatus of claim 1 wherein said vapor filter comprises a fine mesh material.

6. The apparatus of claim 1 wherein said sleeve portion comprises a plastic sleeve attached to said substrate

7. The apparatus of claim 1 wherein said cover and said housing are formed from a plastic material.

8. A method for forming a vapor sensor apparatus, comprising the steps of:

providing a substrate containing a sensing element, wherein said substrate is located proximate to a sleeve portion which covers and protects said sensing element;

connecting a vapor filter to an end of said sleeve portion, wherein said end of said sleeve portion is located opposite said sensing element; and

providing a housing for retaining said substrate and a cover which snaps onto said housing, wherein said housing comprises walls from which a hole is formed through which vapors may pass, and wherein housing and said cover protect said vapor sensor apparatus from gravitationally settled materials thereof.

9. The method of claim 8 further comprising the step of configuring a plurality of contoured surfaces on said vapor sensor apparatus, wherein said plurality of contoured surfaces form least one recessed area that allows access to vapors to said hole.

10. The method of claim 8 further comprising the step of locating said hole is located centrally over above sensing element.

11. The method of claim 8 further comprising the step of forming said vapor filter from a fine mesh material.

12. The method of claim 8 further comprising the step of configuring said sleeve portion to comprise a plastic sleeve attached to said substrate

13. The method of claim 8 further comprising the step of forming said cover and said housing are from a plastic material.

14. A vapor sensor system, comprising:

a gas vapor sensor comprising a substrate that includes a sensing element, wherein said substrate is located proximate to a sleeve portion which covers and protects said sensing element, wherein said gas vapor sensor further comprises a gas vapor filter affixed to an end of said sleeve portion, wherein said end of said sleeve portion is located opposite said sensing element; and

a water heater to which said gas vapor sensor is mounted, wherein said gas vapor sensor is mounted proximate to said gas vapor sensor in a manner which reduces air flow to said sensing element and prevents tampering of said gas vapor sensor, such that said gas vapor sensor automatically shuts an ignition device associated with said water heater if said gas vapor sensor detects gas vapors.

15. The system of claim 14 wherein said gas vapor filter comprises a permeable membrane.

16. The system of claim 14 further comprising a controller and a microprocessor associated with said gas vapor sensor, wherein said controller and said microprocessor respectively control operations of said

gas vapor sensor and processes vapor detection information.

17. The system of claim 14 further comprising a housing for retaining said substrate and a cover which snaps onto said housing, wherein said housing comprises walls from which a hole is formed through which vapors may pass, and wherein housing and said cover protect said gas vapor sensor from gravitationally settled materials thereof.

18. The system of claim 17 wherein said gas vapor sensor comprises a plurality of contoured surfaces which form least one recessed area from plurality of contoured surfaces, such that said at least one recessed area allows access to vapors to said hole.

19. The system of claim 18 wherein said hole is located centrally over above sensing element.

20. The system of claim 14 wherein said vapor filter comprises a permeable membrane.